

compound selected from the group consisting of aluminum halide, alkyl aluminum halide, gallium halide, and alkyl gallium halide and wherein said second component is selected from the group consisting of quaternary ammonium, quaternary phosphonium, and tertiary sulfonium, and wherein said product has a viscosity in excess of 22 ct at 100°C.

24. (New) A high viscosity polyalphaolefin composition of claim 23 wherein said product has a dimer content of less than 2 weight percent.

25. (New) A high viscosity polyalphaolefin composition of claim 23 wherein said product has a viscosity of at least 30 ct at 100°C.

26. (New) A high viscosity polyalphaolefin composition of claim 23 wherein said product has a pour point of less than -30°C.

27. (New) A high viscosity polyalphaolefin composition of claim 23 wherein said product has a viscosity of not less than 22 cst at 100°C.

~~28. (New) A process comprising:  
contacting under reaction conditions a feed comprising an alpha olefin having four carbon atoms with an acidic ionic liquid oligomerization catalyst formed by combining aluminum halide and trimethylamine hydrochloride to thereby form a reaction product comprising a polyalphaolefin product.~~

~~29. (New) A process as defined in claim 28 wherein the mole ratio of aluminum halide to trimethylamine hydrochloride combined to form said acidic ionic liquid oligomerization catalyst is within the range of from about 1:1 to about 5:1.~~

~~30. (New) A process as defined in claim 29 wherein the contacting step is conducted in the absence of an organic diluent.~~

31. (New) A process as defined in claim 30 wherein the contacting step is carried out at a temperature below about 50°C.

32. (New) A process for producing a polyalphaolefin product, said process comprises:

mixing an alpha olefin feed comprising at least 1-decene or 1-dodecene with an effective oligomerizing amount of an acidic ionic liquid oligomerization catalyst comprising a first component and a second component wherein said first component is a compound selected from the group consisting of aluminum halide, alkyl aluminum halide, gallium halide, and alkyl gallium halide and wherein said second component is selected from the group consisting of quaternary ammonium, quaternary phosphonium, and tertiary sulfonium to produce a reaction product comprising polyalphaolefin.

33. (New) A process as recited in claim 32, further comprising:

forming an organic phase comprising said reaction product and an ionic liquid phase comprising said acidic ionic liquid oligomerization catalyst.

34. (New) A process as recited in claim 33, further comprising:

separating said organic phase into a first product comprising unreacted alpha olefin or dimer of alpha olefin and a polyalphaolefin product comprising oligomers of alpha olefin.

35. (New) A process as recited in claim 34, further comprising:

hydrogenating said polyalphaolefin product.